

Please amend claims 1-4, 6-9, 11-14, 16-19, 21-24, 39-43.

1. (Twice Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors; and

a peripheral driver circuit, having a second plurality of thin film transistors [each including an active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including an active region,

wherein a metal element is included at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$  in the active region of at least one of only the second plurality of thin film transistors, [and]

wherein each of the first and second plurality of thin film transistors has a channel forming region [constructed by a silicon semiconductor thin film having mono-domain structure] formed in a monodomain region of a semiconductor film, said monodomain region being regarded as a single crystal region, and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

2. (Amended) [The] A circuit [of] according to claim 1 wherein the metal element [includes at least one of] comprises a material selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Au.

3. (Amended) [The] A circuit [of] according to claim 1 wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$

*C<sup>2</sup> cont*

or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ .

*E*

4. (Amended) [The] A circuit [of] according to claim 1 wherein the [silicon] semiconductor [thin] film includes carbon and nitrogen at a concentration of  $1 \times 10^{16}$  to  $5 \times 10^{18} \text{ cm}^{-3}$ , and oxygen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{19} \text{ cm}^{-3}$ .

6. (Twice Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors, each of said first plurality of thin film transistors including a first active region; and

*3/*

a peripheral driver circuit[, ] having a second plurality of thin film transistors [each including a second active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including a second active region,

*Sub*

wherein a metal element is included at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$  in the second active regions of at least one of only the second plurality of thin film transistors, [and]

wherein each of the first and second active regions comprises a crystalline semiconductor film [which is] being doped with hydrogen[,] and [has] having no or substantially no grain boundary therein, and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

7. (Amended) [The] A circuit [of] according to claim 6 wherein the metal element [includes at least one of] comprises a material selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Au.

X  
C  
8. (Amended) [The] A circuit [of] according to claim 6 wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ .

9. (Amended) [The] A circuit [of] according to claim 6 wherein the [silicon] semiconductor [thin] film includes carbon and nitrogen at a concentration of  $1 \times 10^{16}$  to  $5 \times 10^{18} \text{ cm}^{-3}$ , and oxygen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{19} \text{ cm}^{-3}$ .

11. (Twice Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors, each of said plurality of thin film transistors including a first active region; and

SEB  
a peripheral driver circuit[,] having a second plurality of thin film transistors [each including a second active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including a second active region, wherein at least one second active region [including] includes a metal element at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$ ,

C5  
cont

wherein at least one first active region includes a metal element [having] at a different concentration [different] from [the concentration of the metal element included in] the second active region,

wherein each of the first and second active regions is [constructed by a silicon semiconductor thin film having mono-domain structure] formed in a monodomain region of a semiconductor film, said monodomain region being regarded as a single crystal region, and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

12. (Amended) [The] A circuit [of] according to claim 11 wherein the metal element [includes at least one of] comprises a material selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Au.

C6

13. (Amended) [The] A circuit [of] according to claim 11 wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ .

14. (Amended) [The] A circuit [of] according to claim 11 wherein the [silicon] semiconductor [thin] film includes carbon and nitrogen at a concentration of  $1 \times 10^{16}$  to  $5 \times 10^{18} \text{ cm}^{-3}$ , and oxygen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{19} \text{ cm}^{-3}$ .

C7  
530

16. (Twice Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors, each of said first plurality of thin film transistors including a first active region; and

*2-3*  
*cont*  
a peripheral driver circuit[,], having a second plurality of thin film transistors [each including a second active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including a second active region, wherein at least one second active region [including] includes a metal element at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$ ,

wherein at least one first active region includes a metal element [having] at a lower concentration than [the metal element included in] the second active region,

wherein each of the first and second active regions comprises a crystalline semiconductor film [which is] being doped with hydrogen[,], and [has] having no or substantially no grain boundary therein, and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

*C8*  
17. (Amended) [The] A circuit [of] according to claim 16 wherein the metal element [includes at least one of] comprises a material selected from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Au.

*E*  
18. (Amended) [The] A circuit [of] according to claim 16 wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ .

C<sup>8</sup>  
cont

19. (Amended) [The] A circuit [of] according to claim 16 wherein the [silicon] semiconductor [thin] film includes carbon and nitrogen at a concentration of  $1 \times 10^{16}$  to  $5 \times 10^{18} \text{ cm}^{-3}$ , and oxygen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{19} \text{ cm}^{-3}$ .

21. (Twice Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors [constructed] formed by a [silicon] semiconductor [thin] film having crystallinity; and

a peripheral driver circuit[, ] having a second plurality of thin film transistors [each including an active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including an active region.

wherein a metal element is included at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$  in the active region of at least one of only the second plurality of thin film transistors, [and]

wherein the active region of at least one of the second plurality of thin film transistors [has mono-domain structure] is formed in a monodomain region of a semiconductor film, said monodomain region being regarded as a single crystal region, and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

22. (Amended) [The] A circuit [of] according to claim 21 wherein the metal element [includes at least one of] comprises a material selected

C<sup>9</sup>  
DSB

C<sup>10</sup>

from the group consisting of Fe, Co, Ni, Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, Au.

C 10 cent

23. (Amended) [The] A circuit [of] according to claim 21 wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ .

E

24. (Amended) [The] A circuit [of] according to claim 21 wherein the [silicon] semiconductor [thin] film includes carbon and nitrogen at a concentration of  $1 \times 10^{16}$  to  $5 \times 10^{18} \text{ cm}^{-3}$ , and oxygen at a concentration of  $1 \times 10^{17}$  to  $5 \times 10^{19} \text{ cm}^{-3}$ .

39. (Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors; and

a peripheral driver circuit[,] having a second plurality of thin film transistors [each including an active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including an active region,

wherein a metal element is included at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$  in the active region of at least one of only the second plurality of thin film transistors, [and]

wherein each of the first and second plurality of thin film transistor has a channel forming region [constructed by a silicon semiconductor thin film having mono-domain structure] formed in a

monodomain region of a semiconductor film, said monodomain region being regarded as a single crystal region, [and]

wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ , and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

40. (Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors, each of said first plurality of thin film transistors including a first active region; and

a peripheral driver circuit[, ] having a second plurality of thin film transistors [each including a second active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including a second active region,

wherein a metal element is included at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$  in the second active regions of at least one of only the second plurality of thin film transistors, [and]

wherein each of the first and second active regions comprises a crystalline semiconductor film [which is] being doped with hydrogen[, ] and [has] having no or substantially no grain boundary therein, [and]

wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element



for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20}$   $\text{cm}^{-3}$ , and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

41. (Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors, each of said first plurality of thin film transistors including a first active region; and

a peripheral driver circuit[, ] having a second plurality of thin film transistors [each including a second active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including a second active region, wherein at least one second active region [including] includes a metal element at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$ ,

wherein at least one first active region includes a metal element [having] at a different concentration [different] from [the concentration of the metal element included in] the second active region,

wherein each of the first and second active regions is [constructed by a silicon semiconductor thin film having mono-domain structure] formed in a monodomain region of a semiconductor film, said monodomain region being regarded as a single crystal region, [and]

wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ , and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

42. (Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors, each of said first plurality of thin film transistors including a first active region; and

CI1  
cont  
a peripheral driver circuit[,] having a second plurality of thin film transistors [each including a second active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including a second active region, wherein at least one second active region [including] includes a metal element at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$ ,

wherein at least one first active region includes a metal element [having] at a lower concentration than [the metal element included in] the second active region,

wherein each of the first and second active regions comprises a crystalline semiconductor film [which is] being doped with hydrogen[,]  
and [has] having no or substantially no grain boundary therein, [and]

wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ , and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

43. (Amended) A semiconductor circuit for an electro-optical device formed on a substrate comprising:

an active matrix circuit having a first plurality of thin film transistors [constructed] formed by a [silicon] semiconductor [thin] film having crystallinity; and

a peripheral driver circuit[, ] having a second plurality of thin film transistors [each including an active region,] for driving the first plurality of thin film transistors, each of said second plurality of thin film transistors including an active region.

wherein a metal element is included at concentration not higher than  $5 \times 10^{19} \text{ cm}^{-3}$  in the active region of at least one of only the second plurality of thin film transistors, and the active region of at least one of the second plurality of thin film transistors [has mono-domain structure] is formed in a monodomain region of a semiconductor film, said monodomain region being regarded as a single crystal region, [and]

wherein the [silicon] semiconductor [thin] film includes a point defect of  $1 \times 10^{16} \text{ cm}^{-3}$  or more, and one of hydrogen and halogen element for neutralizing the point defect at a concentration of  $1 \times 10^{15}$  to  $1 \times 10^{20} \text{ cm}^{-3}$ , and

wherein the semiconductor film has a thickness of 200 to 2000 Å.

Please add new claims 44-53.

--44. A device according to claim 1 wherein said semiconductor film comprises silicon.

45. A device according to claim 6 wherein said semiconductor film comprises silicon.

46. A device according to claim 11 wherein said semiconductor film comprises silicon.

47. A device according to claim 16 wherein said semiconductor film comprises silicon.

48. A device according to claim 21 wherein said semiconductor film comprises silicon.

49. A device according to claim 39 wherein said semiconductor film comprises silicon.

50. A device according to claim 40 wherein said semiconductor film comprises silicon.

51. A device according to claim 41 wherein said semiconductor film comprises silicon.

52. A device according to claim 42 wherein said semiconductor film comprises silicon.

53. A device according to claim 43 wherein said semiconductor film comprises silicon.--

*cont*